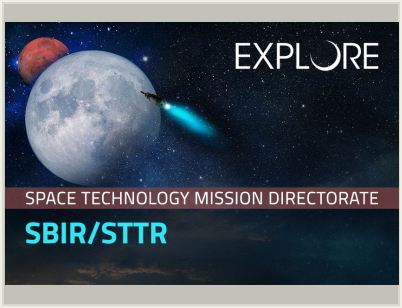
High Resolving Power Volume Diffractive Gratings for 400-2700 nm Spectral Range, Phase I

Completed Technology Project (2006 - 2006)

Project Introduction

The purpose of this NASA SBIR Phase I proposal is to develop a novel type of high resolving power diffraction gratings based on volume Bragg gratings technology. The key innovation to be used for creation of these gratings is the patented technology on production of high efficiency volume diffractive elements in photo-thermo-refractive (PTR) glass on which OptiGrate has an exclusive license from the University of Central Florida. Gratings with diffraction efficiency more than 90% and resolving power up to 20,000 will be demonstrated for the spectral analysis applications in the visible and near-IR spectra (from 400 to 2700 nm). These gratings will have 25- to 50-mm aperture with the spectral resolution down to 50 pm and less. This, to the best of our knowledge, will exceed parameters of all comparable gratings available nowadays. Moreover, PTR volume diffractive gratings are stable over time for decades, thermally-stable up to 400??C, their resistance to CW laser radiation exceeds 10 kW/cm^2, and laser-induced damage threshold is 10 and 40 J/cm^2 for 1- and 8-nm pulse width, respectively. Absorption of these gratings is only 0.1 cm^-1 at 1 um wavelength after exposure to 10 Mrad of gamma radiation.

Primary U.S. Work Locations and Key Partners



High Resolving Power Volume Diffractive Gratings for 400-2700 nm Spectral Range, Phase I

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Organizational Responsibility	1
Project Management	2
Technology Areas	2

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

High Resolving Power Volume Diffractive Gratings for 400-2700 nm Spectral Range, Phase I

Completed Technology Project (2006 - 2006)

Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
OptiGrate Corporation	Supporting Organization	Industry	Orlando, Florida

Primary U.S. Work Locations	
Florida	Maryland

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers